

Recommendation 14-2R4

USE OF THE 37 - 38 GHz SPACE RESEARCH SERVICE ALLOCATION

The SFCG,

CONSIDERING

- a) that the 37-38 GHz band is allocated to the space research service in the space-to-Earth direction;
- b) that space-to-Earth links for missions to the sun-Earth libration point (L2) and future planetary missions using this band are characterised by very low signal levels because of their distance from Earth;
- c) that the 37-38 GHz space research allocation may be used for space-to-Earth links for manned developmental lunar/planetary missions, for high data rate space-based astronomy systems (e.g., space VLBI) and for other space research service activities as needed;
- d) that high density fixed service and fixed satellite service systems are planned to be operated in 37-38 GHz and 37.5-38 GHz respectively;

NOTING

that this Recommendation may have to be revised once final PFD limits have been adopted for the band 37.5-38 GHz at a future competent conference;

RECOMMENDS

- 1. that sun-Earth libration point (L2) missions and manned developmental lunar/planetary missions deciding to use the 37-38 GHz band implement their space-to-Earth links in the 37-37.5 GHz portion of the band, with associated Earth-to-space links in the 40-40.5 GHz band or other Earth to space bands as appropriate;
- 2. that Cat. A Space Research service missions, that can share with FSS, be accommodated in the 37.5-38 GHz portion of the band with associated Earth-to-space links in appropriate bands;

3. that high data rate space-based astronomy systems (e.g., S-VLBI) space-to-Earth links operating in the space research service in the 37-38 GHz band should take into account space-to-Earth links for future missions in the lower 500 MHz of the band;
4. that Member agencies take into account the information contained in the Annex when examining intra-service sharing in the 37-38 GHz band.

ANNEX TO REC 14-2R4

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This Recommendation provides guidelines for 37-38 GHz SRS downlink band partitioning. Some typical space research activities are recognized and a few major parameters of each activity are listed in Table I:

TABLE I

Activity:	Range (km)	Required or Requested Bandwidth (Min-Max) (MHz)	Spreading Loss Variation (dB)¹	Range-Based Relative Performance (dB)
1) <u>Planetary Exploration missions (Mars)</u>	min 60E6 max 39E7	80 – 8000 ³ 2 – 200 ²	16	-52+/-8
	2 000 000	(ITU-R	Planetary/Near Earth	Definition)
2) <u>Libration point missions (L2, S-E)</u>	1 500 000	200 ⁴	nil	-6
3) <u>Lunar exploration missions</u>	380 000	500 ⁵	nil	0 (Ref.)
4) <u>High data rate space-based astronomy missions (e.g. S-VLBI)</u>	typ: 5 000 - 40 000 max:2 000-400 000	1 000 ⁶	18 46	29+/-9 23+/-23
5) <u>Missions employing Near Earth Orbiters</u>	200 - 2 000	500 ⁷	20	56+/-10

Footnotes appear on the next page.

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- 1) For constant spacecraft EIRP.
 - 2) Present technology: (50W/5m dish)(50k/34m dish)(QPSK/R=1/2 code) supports 1-5 Mb/s at max Mars range (2-10 MHz required). Projected technology (100W/10m dish)(50k/70m dish)(Turbo) supports 100 Mb/s at max Mars range (200 MHz required). A bandwidth request of at least 100 MHz will not nearly fulfill the projected capability at min Mars range.
 - 3) Minimum range bandwidths derived from the bandwidths projected for the maximum range.
 - 4) ESA, 1999 proposal.
 - 5) NASDA, 1998 request (METS).
 - 6) NASA, 1998 request (ARISE). Two polarizations required.
 - 7) Suggested maximum.
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